

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

TITLE V (FINAL PERMIT) NO. V-04-042 (REVISION 2)

LAFARGE NORTH AMERICA

SILVER GROVE, KY

June 27, 2006

CAROLINA ALONSO, REVIEWER

Source I.D. #: 021-037-00090

Source A.I. #: 591

Activity #: APE20060002

SOURCE DESCRIPTION:

Lafarge operates a synthetic gypsum wallboard forming facility in Silver Grove, Kentucky. The facility, which commenced operation on June 25, 2000, produces wallboard from synthetic gypsum (calcium sulfate dihydrate [CaSO₄•2H₂O]). Synthetic gypsum is a beneficial by-product of the flue-gas desulfurization systems of power plants.

In the process, gypsum is first dried in a dryer and then sent to a calciner. The resulting stucco is then mixed with various additives and foaming agents to form a slurry, which is fed between paper layers on a forming line to make a continuous board. The wallboard attains firmness as the gypsum begins to recrystallize on the forming line. The board is then passed through a dryer to remove excess water. The boards are then trimmed, marked and stacked.

The Silver Grove facility generates airborne pollutants, primarily from combustion of natural gas and from the handling and processing of gypsum, stucco, and other materials. Low-NO_x burners are employed in all of the combustion units, which are exclusively fired on natural gas. Material processing and conveying systems are equipped with integrated baghouse systems to capture products and minimize emissions. The potential for fugitive PM emissions from gypsum storage and vehicle movements on roads is minimized through established work practices that are executed in accordance with written procedures stipulated in the permit.

COMMENTS:

Source Classification

The Silver Grove facility is located within the northern Kentucky portion of the Metropolitan Cincinnati Interstate Air Quality Control Region. This area is currently designated as in attainment or unclassifiable for all criteria pollutants except for ozone and fine particulate matter less than 2.5 microns (PM_{2.5}). The Cincinnati area was designated as nonattainment with respect to the 8-hour average ozone National Ambient Air Quality Standard (NAAQS) effective June 15, 2004. Both VOC and NO_x are regulated as precursors to ozone. At the time the original permit action for the Silver Grove facility was completed in 1999, the area was also a nonattainment area under the 1-hour average ozone NAAQS, which is no longer in place. (The area was re-designated to attainment of the 1-hour standard in August 2002.)

Gypsum processing is not on the list of 28 Prevention of Significant Deterioration of Air Quality (PSD) source categories defined at 401 KAR 51:001, Section 1 (120)(a)(1)(b). Thus, the major source threshold for attainment pollutants under the PSD program is 250 tpy. Fugitive emissions are not counted towards this total in determining the source status per 401 KAR 51:001, Section 1 (120)(c). Without any constraints on production rates or other process variables, potential emissions of total particulate matter (PT), particulate matter less than 10 microns (PM_{10}), carbon monoxide (CO) and sulfur dioxide (SO_2) for the plant are less than the 250 tpy major source threshold. Performance emission testing is performed annually in accordance with the permit to verify emission levels of CO. (All other PSD regulated pollutants are well below thresholds). Historical tests have demonstrated that existing actual CO emission levels for the existing plant are below the major source thresholds, confirming the plant's true minor status. Thus, the facility is an existing minor source for 401 KAR 51:017 (PSD) purposes.

The major source threshold under the Nonattainment NSR program is 100 tpy for VOC and NO_X . Potential VOC and NO_X emissions of the plant at maximum equipment capacities are less than the 100 tpy for VOC but more than a 100 tpy for NO_X . In order to preclude applicability of 401 KAR 51:052 (nonattainment NSR), Lafarge has accepted limits for NO_X emissions. As with CO, annual emission testing on the major combustion systems for NO_X has to be done to confirm that emissions are kept less than the threshold. VOC emissions, which are set on a mass balance basis, are well below the threshold. After the proposed modifications, the facility will be classified as a major source per 401 KAR 51:001 definitions for its emission of $PM_{2.5}$ and NO_X .

With respect to $PM_{2.5}$, the Cincinnati area (including Campbell County) was recently designated as a nonattainment area under the new $PM_{2.5}$ NAAQS effective April 5, 2005. On September 8, 2005, EPA published a proposed implementation rule for the $PM_{2.5}$ standards. Kentucky has until April 8, 2008 to develop a State Implementation Plan (SIP) to implement the new NAAQS. For the interim period, EPA issued a memorandum on April 6, 2005 advising states to use existing PM_{10} nonattainment NSR programs as a surrogate for $PM_{2.5}$ until SIPs are revised accordingly. This memo also provides that for sources whose particulate emissions are predominately coarse, the $PM_{2.5}$ fraction of PM_{10} emissions can be quantified using emission tests or other reasonable data. Lafarge has conservatively assumed that all PM emissions from combustion sources are in the form of $PM_{2.5}$. Lafarge estimated $PM_{2.5}$ potential emissions from non-combustion processes based on an assumed ratio of $PM_{2.5}$ to PM consistent with particle size distribution data published by EPA for the major process units in gypsum manufacturing industry. Lafarge also conducted stack tests on the three major PM emission sources to verify these ratios. Based on this data, Lafarge has demonstrated that potential $PM_{2.5}$ emissions from the existing plant are less than 100 tpy, and thus the facility is a minor source for 401 KAR 52:052 purposes for $PM_{2.5}$.

The Silver Grove facility is a major source under the Title V permitting program as potential emissions of both PM_{10} and CO exceed 100 tpy.

MINOR PERMIT REVISION FOR using Hydraulic Mulch on gypsum storage piles:

Lafarge proposes the use of Hydraulic Mulch (a comprised of cellulose fibers, typically derived from paper) as a substitute for outdoor gypsum storage piles. The Hydraulic Mulch pile covering is expected to be as effective as tarps at preventing the wind erosion of particulate matter.

PERIODIC MONITORING:

None

OPERATIONAL FLEXIBILITY:

None

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.